

METHOD AND APPARATUS FOR LOW-SPEED, HIGH-THROUGHPUT FIBER DRAWING USING COILED FIBER LOOPS

ABSTRACT

A method and apparatus for continuous drawing of fibers in a form of coiled fiber loops. The fiber is continuously wound about receiving ends of a plurality of conveyer-drawing members (CDM) [e.g., rotating threaded spindles (54) or circulating endless chains (80)] disposed about a central axis and diverging from this axis. Coiled fiber loops are conveyed along the central axis and simultaneously drawn by enlarging a circumference of the fiber loops by the CDM. The leading fiber loops are continuously unwound at delivery ends of the CDM and conveyed from the drawing apparatus at an outlet speed. A heat chamber (11) envelopes the conveyer-drawing members. Thus, a fiber speed in the drawing process comprises a fraction of the outlet speed. The process can operate at lower drawing speed, longer drawing time, and the same or higher the outlet speed and throughput than in commercial drawing processes. The method will produce high-strength/high-modulus/low-shrinkage polymer fibers.